31 March 1964

MEMORANDUM FOR: Director of Central Intelligence

SUBJECT : NRO Proposals for Advanced Search and Surveillance Systems

1. In his briefing of 18 March 1964, Secretary McMillan described two improved search and surveillance systems which he thought might replace CORONA. The following comments are provided for your background use.

2. The very high resolution VALLEY system will probably produce two foot ground resolution in a swath width of fifty nautical miles. It involves two 100 inch focal length panoramic cameras with three strands of film each. Payload is estimated by Eastman Kodak to be approximately 8200 pounds and will require a TITAN III booster. Although we have not yet had access to the Eastman Kodak studies, we have no reason to believe that this goal cannot be met. However, it is clear that because the system is harnessed to the TITAN III development program, it is not likely to be an immediate follow-on to the CORONA and is more like a third generation system. In a third generation system, however, one would hope to have other than black and white capabilities for the search mission (see below), so it is by no means clear that this is the optimum solution.

3. The more immediate solution is the ATLAS AGENA system which has been put together on paper by the NRO staff within the past month. It consists of two 66 inch focal length LANYARD cameras and a single 24 inch focal length CORONA panoramic camera. The LANYARD cameras would give continuous stereo over a 55 nautical mile strip below the flight path and an area coverage of 1.7 million square miles. The resolution of this stereo pair would be four feet, which is about that to be expected from the present LANYARD cameras. The single CORONA camera would provide a 174 nautical swath width and 13 foot ground resolution, although this might be as low as 10 feet if improvements in the basic CORONA camera are realized. The area coverage of that camera would be at five million square miles.

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There are three basic objections to going ahead with this system at the present time.

4. The first problem is that the area of high and low resolution coverage are not commensurate.

5. Secondly, it is not clear what complementary function the various cameras serve. Rather it seems to be a hasty kluge of existing hardware to satisfy the demand for advanced planning in the search area, which has been notably lacking in the NRO for many years.

6. The third and probably major disappointment in the ATLAS AGENA system is that it is apparently to be a black and white film system. Our studies of the FULCRUM system indicate that there are very substantial intelligence gains to be made in doing the search mission if one photographs the same area in somewhat different parts of the optical spectrum. This is not the familiar IR and UV argument. Rather it is a demonstrable recognition that terrain and manmade objects have drastically different contrasts when viewed in different parts of the optical spectrum rather than in a broad pancromatic way. Our feeling is that a follow-on search system should take advantage of this possibility for dividing up the photographic job into complementary spectral bands and thereby enchancing the probability of locating significant targets in search photography. Of course, we would propose to backstop these multi-band sensors with pancromatic camera, possibly the M-2 improvement of the present CORONA. Our real hope is that we can put together a system with recognized growth potential in which various cameras and film components of the total system can be exchanged and upgraded as the life of the system progresses. I should add that this study emerged from an intimate and exhaustive interaction with the photo interpreters at NPIC and the users here at CIA. The McMillan proposal has had none of this.

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ALBERT D. WHEELON
Deputy Director
(Science and Technology)

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MEMORANDUM FOR: DDCI

Bud comments on McMillan proposals for advanced search and surveillance satellite reconnaissance systems.

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